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Abstract

For a long time, the World Trade Organization (WTO) has been seen as the privileged multilateral regime to regulate trade. However, given its slow progress in negotiating new trade rules, countries have increasingly shifted their focus to preferential trade agreements (PTAs) since the early 2000s. Focusing on a timely and increasingly important topic (digital trade) we explore how countries' interactions in the WTO impacts on their approaches in designing rules in PTAs. Using newly collected data on digital trade-related provisions in almost 350 PTAs signed since 2000, we find that countries' participation in digital trade-related initiatives at the WTO spill over to the design of their PTAs. More precisely, we show that countries which actively participate in the discussions of the WTO Work Programme on Electronic Commerce are more likely to negotiate ambitious commitments on digital trade in their PTAs. Furthermore, our analysis indicates that countries which participate in the WTO-based plurilateral Information Technology Agreement (ITA) are more likely to commit to deeper cooperation in the area of digital trade. More broadly, this article contributes to our understanding of the dynamics of regime complexity and how interaction in the multilateral system is associated with regional and bilateral trade regimes.

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1 Regime complexity in international trade

Regime complexity has characterized the international trading system for quite some time (Alter and Meunier, 2009; Alter and Raustiala, 2018). Legal scholars have generally contributed to a narrative of hierarchy between multilateral and regional rules, basing their assessment on the constitution of the World Trade Organization (WTO). The WTO interprets regional trade arrangements, such as preferential trade agreements (PTAs), as exceptions to the guiding principles of the Geneva-based system: non-discrimination and the most-favourite-nations clause. Another narrative has focused on overlapping and non-hierarchical regimes instead. This has led to a number of studies on the strategic usage of forum-shopping and its consequences (Busch, 2007; Alter and Meunier, 2009). The second narrative has received more traction over time, yet, the attention has moved on to study the specific relationship between multilateralism and preferentialism. Are these approaches complements, substitutes, or do they produce fragmentation of international trade law?

Certainly the recent surge of PTAs has been another defining moment in this debate (Bown, 2017). Today, every WTO Member has at least one PTA whereas some WTO Members have more than 50 such agreements. And the process does not stop there as PTAs increasingly undergo re-negotiations or modernizations. Therefore, the narrative on "PTAs as exceptions" has further lost traction. At the same time, systematic evidence that PTAs have undermined the WTO system and have led to substantial fragmentation is also lacking. On the contrary, some recent work on the WTO-PTA linkage suggests that WTO law is well embedded in PTAs and that this is in particular true for active signatories of PTAs (Allee and Elsig, 2019; Allee et al., 2017).

While PTAs are on the rise, attention on rules for digital trade has also increased in recent years. They are part of "behind-the-border" regulations that affect trade in goods and services as well as investment flows. Yet, digital trade rules are not only about goods or services that are provided electronically, but about how to deal with data that is embodied in various steps of the product cycle more generally: from marketing, design, production, product and service delivery towards after-sales activities.

Early versions of this debate entered the WTO in the late 1990s when the Information Technology Agreement (ITA) was reached in 1996 and the WTO Work Programme on Electronic Commerce was established in 1998. The ITA is a plurilateral agreement, or what Hoekman and Sabel (2019) refer to as a "critical mass agreement", that was initially signed by

a group of 29 WTO members (including the then 15 European Union members as one entity) who committed to completely eliminate tariffs on the 201 sector-identified information technology (IT) products covered in the agreement. Collectively, the ITA participants account for approximately 90 percent of global trade in the products covered (Wilkinson et al., 2016). The WTO Work Programme on Electronic Commerce was put into place to explore the relationship between existing WTO agreements and the growing importance of e-commerce.

E-commerce or what has become known more recently as "digital trade" poses many regulatory questions.[1] What stand out are questions related to data protection and privacy on the one hand and free flow of data on the other hand. Data flows further pose challenges to regulators in particular in cases where PTA parties have very different levels of domestic law and protection; in some countries we find even a lack of regulation. Data also comes in various forms and their sheer quantity poses an additional challenge for the implementation of laws both internally but also extra-territorially. We can observe different initiatives and strategies to regulate digital trade, e.g. the United States-Mexico-Canada Agreement (USMCA) rules out local storage requirements to allow the free flow of data, whereas the European Union (EU) through its new EU data protection laws is unilaterally exporting and enforcing EU law worldwide.

As we see with the example of the USMCA, the newer generation of PTAs has started to include digital trade provisions in PTAs whereas little progress is visible in multilateral negotiations.[2] This leads to the observation that PTAs have become the real game in town as far as international cooperation in digital trade regulation is concerned. The example of the export of EU law suggests that some actors and governments are not only setting standards unilaterally, but most likely will work towards enshrining these laws in PTAs to help diffuse digital trade-related standards.[3]

Our contribution to this special issue is to sharpen our understanding of the dynamics of regime complexity by investigating how activities in one forum (the WTO) spill over to the regional forum (here PTAs). By choosing digital trade, we focus on a relatively new topic where so far systematic data was missing. Our article explores this WTO-PTA linkage and tests various explanations to account for PTA design. We use a novel database that codes digital trade-related provisions in 347 PTAs.

We find that signatories of the most prominent digital trade-related WTO agreement so far (the ITA) and those WTO Members most active in WTO Committees related to the Electronic Commerce Work Programme tend to have the deepest provisions on digital trade in PTAs.

These findings suggest that the WTO has an impact beyond the actual treaty commitments and can shape the content of PTAs. Our analysis further shows that trade flows in IT products, domestic exposure to digital trade and whether the US is a PTA partner matter for ambitious PTA commitments in this area.

The article is structured as follows. In the next section, we briefly review the literature on the WTO-PTA linkage and, in particular, past research on this relationship related to digital trade. Based on the research gaps discussed, we then provide an argument about how rule-making and committee work in the WTO may spill over to PTA negotiations and eventually design outcomes in section three. In section four we present parts of a novel database and describe our variables of interest. In section five we test our hypotheses and discuss the empirical results. Section six concludes.

2 Literature

There have been numerous studies that focus on how the WTO and PTAs compete and co-exist as platforms for negotiations or dispute settlement (Baldwin, 2006; Busch, 2007). Given the lack of progress in WTO negotiations, relatively few studies have, however, systematically explored how PTA design is affected by WTO law. Some case studies provide evidence on spill-overs from WTO law and practices to regional trade agreements such as Mercosur (Arnold and Rittberger, 2006). In the first systematic study on the extent to which the WTO is "present" in PTAs, Allee et al. (2017) examine textual over-laps of legal provisions. They find both large amounts of copy-pasting and substantial references to WTO articles in PTAs. Overall, the authors stress the significant presence of WTO commitments and how PTA law re-enforces and supports WTO law. This work suggests a less conflict-laden competition between WTO and PTA commitments than often argued. The authors further find that in particular established areas of trade regulation (e.g. trade remedies) are imported more from WTO law than newer areas (e.g. procurement, investment) and that the important trade powers (those that also have the means to depart from WTO obligations) are importing WTO law commitments well above average. Another recent study on PTA design focuses on how participation and experience in WTO dispute settlement shapes PTA negotiations and outcomes. Wüthrich and Elsig (2019) develop an argument about how PTA partners learn from participation in dispute settlement proceedings of the WTO. In particular, import-competing sectors critically review WTO cases

lost by their government which spill over to PTA design in form of additional flexibility instruments.

The WTO-PTA linkage related to digital trade has also received little attention so far. Most research has focused on either the work at the WTO related to e-commerce negotiations or on PTA chapters on digital trade. Wunsch-Vincent (2004), for instance, shows that early discussions in the WTO on this topic were primarily driven by a small group of developed countries including Australia, the EU, Japan and the US. Wunsch-Vincent and Hold (2016) point out that some limited progress was made on issues such as the classification of the content of certain electronic transmissions, development-related issues, fiscal implications of e-commerce, the relationship between e-commerce and traditional forms of commerce, the imposition of customs duties on electronic transmissions, competition, jurisdiction and applicable law and other legal issues.[4] The literature also suggests that the attention has shifted over time from the WTO to PTAs as the prime location for rule-making resulting from diverging interests among WTO Members. In line with increasing politicization in the context of the WTO, we also witness PTA commitments that vary considerably (Wunsch-Vincent and Hold, 2016; Wu, 2017).[5] To a certain extent, the diverging PTA templates reflect what Aaronson and Leblond (2018) refer to as a "new digital divide". The authors argue that China, the EU and the US have established three distinct data realms with different approaches to data governance. These patterns of divergence are also identified by other recent studies including contributions by Gao (2018), Sen (2018), Azmeh et al. (2019) and Ferencz and Gonzales (2019).

3 Argument

This section develops an argument about WTO-PTA linkage that has not received sufficient scholarly attention. So far, the contributions that focus on that relationship are mostly focused on established WTO law and dispute settlement activities shaping PTA treaty texts. There is evidence that PTAs often build on legal concepts and language found in the General Agreement on Tariffs and Trade (GATT), the General Agreement on Trade in Services (GATS) and other WTO agreements when referring to "legitimate policy objective" or "disguised restriction on trade". This applies also to digital trade (Wu, 2017). Recent work, however, does not sufficiently take into account how day-to-day WTO work and agreement directly touching on digital trade are related to PTA commitments. We attempt to address this research gap.

We assume that the WTO can serve as an important platform for the tabling of proposals for new rules. The main actors in ongoing exchanges are WTO Members themselves. Past work on the WTO has shown how influential the official government delegations are as actors in Geneva. The organization has rightly been called "member-driven" (Elsig, 2010). In other words, trade diplomats are actively shaping and overseeing the work of the WTO, in particular through Committees and informal and formal negotiations. Most proposals are directly tabled by WTO Members in the appropriate technical Committees.

There is evidence that this work then is taken on board in subsequent PTA negotiations. We know from studies that focus on other types of behind-the-border rules that WTO Committee work can influence PTA design. In a study of 124 PTAs, for example, Lejárraga (2013) finds that many of the WTO-plus provisions on transparency in sanitary and phytosanitary measures (SPS) emanated from recommended procedures for implementing the transparency obligation issues by the WTO SPS Committee. Similarly, many of the WTO-plus provisions for Technical Barriers to Trade (TBT) stem from the recommendations of the WTO TBT Committee. In a more recent analysis of 260 PTAs, McDaniels et al. (2018) also find that the design of PTA TBT chapters is linked to the work and decisions taken in the WTO TBT Committee. In the area of digital trade, there is some anecdotal evidence that this mechanism may also be in place. In the context of the WTO Work Programme on Electronic Commerce, the concept of "technical neutrality" was largely debated in WTO Committees, which later found expression in trade agreements such as in the EU-Japan Free Trade Agreement.[6]

Building on this, we develop our first hypothesis. We conjecture that the spill-over effect may be particularly strong when WTO Members are not only present in Geneva, but when they actively shape digital trade discussions and formulate country positions. The more actively involved negotiators are, the greater is also their personal standing in the diplomatic community and the greater the buy-in effects of negotiation outcomes overall (see Elsig and Milewicz, 2017). This exposure to WTO daily work is important as it is not unusual that trade diplomats serving in Geneva have gone back to negotiating trade agreements after their postings in Geneva. Even a Korean Member of the Appellate Body terminated his term early in 2017 to be in charge of the re-negotiations of the US-Korea trade negotiations. Therefore, our first hypothesis reads:

H1: *The more active a WTO Member is in digital trade-related discussions at the WTO, the more likely the WTO Member is to commit to deeper cooperation in digital trade in its PTAs.*

Besides an effect on PTAs through WTO Committee work, we also expect the decision of WTO Members to join existing international agreements that focus on digital trade to spill-over to PTA design. Ratifying such international agreements under the auspice of the WTO signals a commitment to negotiate PTAs with digital trade-related provisions. Even if countries have not been actively involved in the negotiations, the signing of a WTO agreement can provide important impetus to be actively shaping the PTA agenda. In addition, agreeing to pluri- or multilateral treaties may already have tempered lobby groups at home that are sceptical vis-à-vis pursuing liberalization strategies when it comes to data-relevant provisions (Claussen, 2019). We therefore expect agreements such as the previously discussed ITA to play an important role in this context and phrase our second hypothesis more generally as follows:

H2: A *WTO Member that signed digital trade-related WTO agreements is more likely to commit to deeper cooperation in digital trade in its PTAs.*

4 Data and methodology

In order to test above hypotheses, our empirical analysis relies on the "Trade Agreement Provisions on E-commerce and Data Flows" (TAPED) database recently published by Burri and Polanco (2020). Based on the "Design of Trade Agreements" (DESTA) database (Dür et al., 2014), TAPED identifies 347 PTAs signed between 2000 and 2019, starting two years after the WTO Work Programme on Electronic Commerce was established. 183 of the 347 PTAs (52%) contain provisions that directly or indirectly regulate digital trade. In total, 99 relevant provisions related to e-commerce, intellectual property, key services sectors, government procurement and trade in goods are included in the TAPED database. A detailed codebook can be found in Burri and Polanco (2020).

For each of these provisions, Burri and Polanco (2020) also assess the degree of legalization and group provisions into soft, mixed and hard commitments. Soft commitments are not enforceable by the PTA parties and include so-called 'best-effort' provisions such as those 'recognizing the importance', 'working towards' or 'promoting' a certain objective. Hard commitments, by contrast, oblige a PTA party to comply with a provision or principle and are enforceable through a dispute settlement system. These provisions tend to contain terms such as 'shall' or 'must'. A provision is considered of mixed legalization if it entails both soft and hard commitments.

4.1 Dependent variables

Based on the TAPED dataset, we construct our dependent variables to measure the degree of digital trade-related commitments. We follow the approach of Dür et al. (2014) and Baccini et al. (2015) and construct different measures of depth of cooperation. Our first dependent variable, *Depth*, is an additive index of the 99 provisions related to digital trade that reflect a certain obligation. *Depth*, however, does not take into account the degree of legalization of the 99 provisions. The PTA with the highest *Depth* is the USMCA, followed by Australia-Singapore (2016) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP, 2018).

Figure 1 illustrates the evolution of PTAs signed since 2000. The left y-axis shows the cumulative number of signed PTAs as well as the cumulative number of PTAs that include provisions related to digital trade. The right y-axis shows the average annual *Depth* of these PTAs. Even though the annual average *Depth* of PTAs fluctuates, there is a clear trend towards increasing Depth of digital trade-related provisions.

[Insert Figure 1 about here.]

In our second dependent variable, *Weighted Depth*, we account for the legalization of provisions. To construct this variable, we follow Hicks and Kim (2012) and weigh soft and mixed provisions with 0.5 and hard provisions with 1 and then create an additive index. *Weighted Depth* provides a more nuanced picture of the enforceability of PTA provisions related to digital trade. Both variables, *Depth* and *Weighted Depth*, however, have the shortcoming that they consider every provision as equally important for the respective additive index.

Recent studies, including Orefice and Rocha (2014), Dür et al. (2014) and Baccini et al. (2015), attempt to overcome this issue by employing factor and principal component analysis. In line with this literature, we follow Dür et al. (2014) and employ a Rasch model to construct our third dependent variable.[7] Rasch models are particularly applicable to binary data. In our case, the Rasch model assumes that all provisions (which are binary – present in a PTA or not) capture one underlying latent dimension. The provisions, however, contribute more or less to this latent dimension. More precisely, provisions that are relatively rare in PTAs contribute more to *Depth* than provisions that are relatively common in PTAs. Figure 2 provides an illustration of the provisions and their frequency in PTAs. We refer to this variable as *Rasch Depth*.

[Insert Figure 2 about here.]

4.2 Explanatory variables

In order to assess the impact of the WTO interaction (in form of negotiations and specific treaties) on the design of digital trade-related cooperation in PTAs, we collect new data and create two specific variables.

The first variable relates to active participation in Committee work at the WTO on digital trade. Already at its second Ministerial Conference in Geneva in 1998, the WTO adopted "The Declaration on Global Electronic Commerce" and established the Work Programme on Electronic Commerce. The e-commerce related discussions were agreed to take place in the Council on Trade in Goods, the Council on Trade in Services, the Trade Related Intellectual Property Rights Council and the Committee on Trade and Development. The General Council was tasked to keep the Work Programme under constant review. To construct our first variable of interest, *WTO Ecommerce Interventions*, we searched the meeting minutes of the Councils (WTO, 2019) and collected WTO Members' interventions on e-commerce until the end of 2018. In total, we analyzed 165 meeting minutes from the Council on Trade in Goods, 150 meeting minutes from the Council on Trade in Services, 131 meeting minutes from the Trade Related Intellectual Property Rights Council, 114 meeting minutes from the Committee on Trade and Development and 254 meeting minutes from the General Council.

As illustrated in Figure 3, the topic of e-commerce attracted a lot of attention among the WTO Members in the first few years after the establishment of the Work Programme. From 2002 onwards, however, e-commerce was rarely discussed in the responsible Councils. In 2011, the topic began to receive increasing attention again.

[Insert Figure 3 about here.]

Our variable of interest, *WTO Ecommerce Interventions*, captures the cumulative count of WTO Members' e-commerce-related interventions in the responsible Councils between 1998 (the establishment of the Work Programme) and the year of PTA signature. Since the unit of our empirical analysis is at the PTA level, the average of this count is calculated for the parties of a given PTA. We expect that countries which have often intervened on digital trade-related topics in the WTO, also include more and deeper digital trade-related provisions in their PTAs.

Our second explanatory variable captures agreed commitments of WTO Members in digital trade-related rules. The only concluded agreement in the WTO so far that aims to liberalize

digital trade-related products is the previously described ITA. The ITA was reached through the "Ministerial Declaration on Trade in Technology Products" at the WTO Ministerial Conference held in Singapore in 1996. By now, 82 countries have signed the ITA which demands from its signatories to completely eliminate tariffs on IT products covered in the agreement. These products include computers, telecommunication equipment, semiconductors, semi- conductor manufacturing and testing equipment, software, scientific instruments, as well as most of the parts and accessories of these products. In 2012, a group of six ITA signatories, including Costa Rica, the EU, Japan, South Korea, Taiwan and the US, officially launched negotiations to expand the ITA. The negotiations concluded in 2015 at the WTO Ministerial Conference held in Nairobi. Since only 30 PTAs were signed since then, we rely on the signatories of the initial ITA to construct our second explanatory variable of interest: *ITA Members Percent*. This variable captures the percentage of PTA parties that are ITA signatories. Since ITA signatories are committed to liberalizing the trade of IT products, we expect them to also commit to deeper cooperation in the regulation digital trade in PTAs. To disentangle the importance of the ITA from WTO membership effect, we also include the percentage of PTA parties that are WTO Members (*WTO Members Percent*) in our empirical analysis.

4.3 Control variables

Our empirical analysis includes a battery of variables that account for alternative explanations for PTA treaty design and some control variables that are regularly found in studies on PTA design to control for confounding factors.

The first variable relates to the importance of digital trade flows. In particular, new areas of trade regulation, such as digital trade, allow for the design of ambitious templates which reflect countries' competitiveness in a growing sector. We expect that countries which trade a lot in digital trade-related products are likely to opt for deeper commitments in PTAs. While it is undisputed that digital trade flows have rapidly grown over the last years, finding a comprehensive data source which covers multiple years and countries presents a challenge. To construct our variable, we rely on a dataset kindly shared by Gnutzmann-Mkrtchyan and Henn (2018) on the trade of products included in the ITA. For each PTA member, we sum its imports and exports of ITA products to compute its total trade in ITA products. As the unit of analysis is the PTA level, we then calculate the average of all PTA members and apply a log-transformation analogous to Copelovitch and Putnam (2014). We call this variable *ITA Trade*.[8]

A second variable of interest relates to existing domestic policies on digital trade. We expect that the more advanced countries' domestic policies are, the more likely they are to agree to ambitious cooperation in their PTAs. The lack of available data sources is a challenge in this context, too. The Global Cyberlaw Tracker of the United Nations Conference on Trade and Development (UNCTAD, 2020), for instance, covers the current state of e-commerce legislation in the fields of e-transactions, consumer protection, data protection/privacy and cybercrime adoption in 194 countries. While this is an interesting snapshot of the current legislative landscape, the dataset includes no information on previous years. Promising work is also conducted by Ferracane et al. (2018). The authors create a Digital Trade Restrictiveness Index (DTRI) and assess 64 countries in terms of their fiscal, establishment, data and trading restrictions. Similar to the UNCTAD dataset, however, the DTRI does not include a time dimension and is therefore not suitable to our analysis of PTAs signed since the year 2000. To proxy for countries' domestic policies and digital readiness, we rely on the World Bank (2020) data on the percentage of population using the internet to construct the variable *Internet Users*. We expect that more digitally restrictive countries have a lower percentage of population using the internet. To check our expectation, we correlated our *Internet Users* variable with the DTRI and found a negative correlation coefficient of 0.5, which provides us with additional confidence in our choice of a proxy variable.[9] *Internet Users* is averaged over the parties of a given PTA since the level of analysis is at the PTA level. We expect that this percentage is positively associated with countries' willingness to commit to deeper digital trade-related cooperation in their PTAs.

A third variable of interest relates to the alleged divide between the digital trade strategies of the EU, US and China (Aaronson and Leblond, 2018). It is well documented that the three powers have strong views on the regulation of e-commerce and data flows and as a consequence they may attempt to instrumentalize the PTA network for the export of their models which would be reflected by deeper commitments.[10] We therefore include the three binary variables *EU, US,* and *CHN*, which are equal to one if one of the countries is a PTA party and zero otherwise.

In line with the existing literature, we include a number of additional control variables in our empirical analysis. Powerful countries, for instance, might be more eager to agree on more ambitious commitments in digital trade. To control for PTA members' economic size, we include their gross domestic product (GDP, constant 2010 US$) and, as the unit of analysis is at the PTA level, calculate the log-transformed average *GDP* for each PTA. As is common in

the literature on PTA design, we also control for PTA members' power asymmetries. Stronger trading nations are not only able to dictate the negotiations but are likely attempting to export their regulatory philosophies to weaker states. Powerful states may dominate bilateral trade talks and, in particular, the enforcement of the agreed trade law provisions. At the same time a weaker PTA party knows how important digital trade-related provisions are for the larger PTA party and that this could lead to more investments and potential increased integration into global value chains. We therefore expect that weaker countries are accepting the demands of the stronger PTA party. In addition to economic size and asymmetries, we also include PTA members' GDP per capita (constant 2010 US$) to control for their wealth. Similar to *GDP*, *GDP per capita* is the log-transformed average of a given PTA's members. All GDP-related variables are calculated based World Bank (2020) data.

Besides countries' differences in their economic size, we also follow the literature and account for differences in their political system. The *Polity* variable is calculated based on data available from the Center for Systemic Peace (2020) and corresponds to the average score of a given PTA's parties. While we include this variable primarily to control for countries' different political systems, we do expect that more democratic countries are more willing to commit to cooperation in the area of digital trade in their PTAs as democracies generally trust each other more and embrace liberal rules (Mansfield et al., 2002). In line with existing literature, we also control for the number of countries that are part of a PTA (*PTA Members*). *A priori*, we do not have strong expectations on whether *PTA Members* is negatively or positively associated with the degree of cooperation. On the one hand, a larger number of *PTA Members* may struggle to agree on digital trade-related topics and therefore only commit to little cooperation. On the other hand, the negotiators may have to include many digital trade-related provisions to make sure that each PTA member's interest has been addressed. Finally, we control for the depth of cooperation that countries have agreed in previous PTAs. This variable takes into account the importance of boilerplate language (Allee and Elsig, 2019; Milewicz et al., 2019) and overall PTA ambitiousness that is rarely lowered from one PTA to the next. Therefore, the level of commitment in one PTA may be strongly influenced by preceding PTAs. The variable *DESTA Depth Previous* is calculated based on Dür et al. (2014) and averaged over a given PTA's parties.[11]

Table 1 presents the descriptive statistics of the dependent, explanatory and control variables outlined above.

[Insert Table 1 about here.]

Our three dependent variables of interest (*Depth*, *Weighted Depth* and *Rasch Depth*) are non-binary ordinal variables. In line with the recent literature (Allee and Elsig, 2016; Baccini et al., 2015), we therefore estimate a series of ordered probit models. As previously mentioned, the unit of analysis is at the PTA level, leaving us with a total number of 347 observations. Accordingly, all explanatory and control variables are aggregated to the PTA level as described above. To address endogeneity concerns, and in line with the literature, the explanatory and control variables are lagged by one year.[12] To account for time and regional factors, we include time and region fixed effects in all our models similar to Allee and Elsig (2016), and use clustered standard errors at the PTA level. We also run a number of robustness checks outlined in more detail in the next section.

5 Results

We present our empirical findings in Table 2. Models 1-3 show the results for the dependent variable *Depth*, while models 4-6 and models 7-9 show the results for the dependent variables *Weighted Depth* and *Rasch Depth*, respectively. We find that Members' interventions in digital trade-related discussions in the respective WTO Councils are positively and statistically significantly associated with the three different measures of depth. These results support our first hypothesis that the more active WTO Members are in digital trade-related discussions at the WTO, the more likely these WTO Members commit to deeper cooperation through PTAs.

Our empirical results also suggest that a higher share of ITA participants among the PTA parties (*ITA Members Percent*) is positively and statistically significantly associated with the three different measures of depth. These results confirm our second hypothesis that ITA participants are indeed more likely to commit to deeper digital trade-related cooperation in their PTAs. These results are robust to the inclusion of PTAs' share of WTO Members (*WTO Members Percent*).

[Insert Table 2 about here.]

The results shown in Table 2 further confirm that countries which trade digital trade-related products, are more likely to commit to deeper cooperation in this area in their PTAs. Similarly, we find a positive and statistically significant association between countries' share of internet users and the probability of including deeper provisions on digital trade-related cooperation.

Finally, our empirical results suggest that US PTAs are more likely to include deeper digital-trade related provisions. Interestingly, we do not find a statistically significant coefficient for EU and Chinese PTAs. This finding might be due to the different strategies the three actors pursue when it comes to governing digital trade and trade flows. The US, for instance, does so through PTAs while the EU trades access to personal data in exchange for regulatory harmonization based on an "adequacy" evaluation by the European Commission.[13] China is known to only include limited aspirational language in its PTAs (Aaronson and Leblond, 2018; Gao, 2018).

As to our battery of control variables, we find no consistent statistical evidence that economic size, wealth or power asymmetries matter for the extent of digital trade-related cooperation. Similarly, our results suggest that PTA cooperation in the digital sphere is not statistically significantly related to countries' political system. Finally, we neither find a statistically significant association between the number of PTA members and the depth of cooperation nor between countries' past and current cooperation commitments.

Since the results shown in Table 2 are based on ordered probit models, only the statistical significance and sign can be interpreted. In order to add further insights, we also calculate the predicted probabilities below. To facilitate illustration, we split the *Depth* variable into quartiles to present shallow, medium shallow, medium deep and deep digital trade-related cooperation. Furthermore, we create binary indicators for our explanatory variables of interest - *WTO Ecommerce Interventions* and *ITA Members Percent*. *WTO Ecommerce Binary* and *ITA Members Binary* are equal to one for observations that are above the respective mean and equal to zero otherwise. We re-run the ordered probit models and report the results in Table 3 and Table 4 in the Annex. Table 5 and Table 6 show the predicted probabilities. We find, for instance, that PTAs with WTO e-commerce interventions above the mean, are nine percentage points less likely to include shallow cooperation with regards to digital trade (Table 5, Depth = 1). At the same time, PTAs with WTO e-commerce interventions above the mean, are seven percentage points more likely to include deep cooperation with regards to digital trade (Table 5, Depth = 4). We also find that PTAs in which more than 62 percent (the mean) of PTA parties are ITA participants, are ten percentage points less likely to include shallow cooperation with regards to digital trade (Table 6, Depth = 1) and eight percentage points more likely to include deep cooperation with regards to digital trade (Table 6, Depth = 4). These results are robust to changing the cut-off point for the binary variable ITA Members Binary to a potentially more intuitive value of 50 percent.

[Insert Table 5 about here.]

[Insert Table 6 about here.]

We also perform a number of robustness checks. First, we run a probit model on a binary outcome variable which is equal to one if a PTA has at least one digital trade- related provision and equal to zero otherwise. The results (Annex, Table 7) indicate that the share of ITA participants among the PTA parties is the driving factor behind the decision of whether to address digital trade-related topics in the PTA at all. We also find that the share of countries' internet users is statistically significant in this context while countries' participation in the digital trade-related discussions at the WTO does not appear to play a statistically significant role. We do find, however, that participation in WTO discussions on digital trade is statistically significant and positive when we re-run the ordered probit models on a sub-sample of PTAs that include at least one digital trade- related provision (Annex, Table 8). These findings point towards a selection process that we leave to future research to address. Finally, we re-run the ordered probit models and include the size of countries' WTO missions in Geneva. Previous research by Wüthrich and Elsig (2019) suggests that countries' legal and negotiation capacity is related to the design of their PTAs. We find that the results for our two explanatory variables of interest are robust to the inclusion of this variable (Annex, Table 9). However, what we can see is that the sheer presence in Geneva has no impact on PTA design in the area of digital trade rules.

6 Conclusion

This article has focused on the regime complexity literature related to trade with a special focus on how interaction in the multilateral regime spills over to the preferential regime. Focusing on a more recent trade topic (digital trade), we find that countries which actively participate in digital trade-related discussions at the WTO are more likely to negotiate ambitious digital trade-related commitments in their PTAs. Similarly, our analysis suggests that countries which participate in the WTO-based plurilateral ITA are more likely to agree to deeper cooperation on digital trade in their PTAs. Our results further indicate that trade in IT products, domestic policies and having the US as a PTA party also impact PTA design in the area of digital trade. Indeed, the analysis suggests that countries that have a competitive advantage in IT-related goods and services trade and that build on established domestic digital trade policies are pushing for deeper commitments.

Future research should focus in more detail at how the work within Committees not only re-enforces the views of some countries' positions vis-à-vis digital trade but also how over time it affects WTO Members without strong views on digital trade policies. With other words, more attention to deliberation effects could yield additional insights as to how WTO Members use WTO Committees to advocate their established policies and how Committee work feeds into national policies by influencing the digital policies approaches. In addition, the conjectured effect from signing a plurilateral agreement in the WTO could be further investigated. In particular, signing a multilateral agreement could temper domestic opposition and veto powers when signing PTA commitments that are deepening existing WTO commitments. Finally, in order to make more explicit statements about causality, an instrumental variable could be explored in future work.

What are further implications of our findings for global trade governance? The article shows that many avenues are impacting on PTA negotiations and the WTO is one of them. Whether this leads to more fragmentation or more coherence in this specific domain of digital trade remains to be seen, but clearly some rule-makers (e.g. the US) are getting their preferred policies reflected in PTAs. So for the US, the WTO's work is rather complementing its efforts questioning once more the current US Administration's mantra that the WTO has been bad for the US.

Given that the EU, China and others pursue different agendas on digital trade, it can well be that e-commerce debates in the WTO will get more politicized over time as the channel is important for the rule-makers to influence the evolving PTA networks. Together with new debates about national security when it comes to data policies, this is bad news for finding consensus in WTO e-commerce negotiations that are ongoing.

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Annex

[Insert Table 3 about here.]

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Tables and figures

Figure 1: Evolution of digital trade-related cooperation in PTAs, 2000-2019

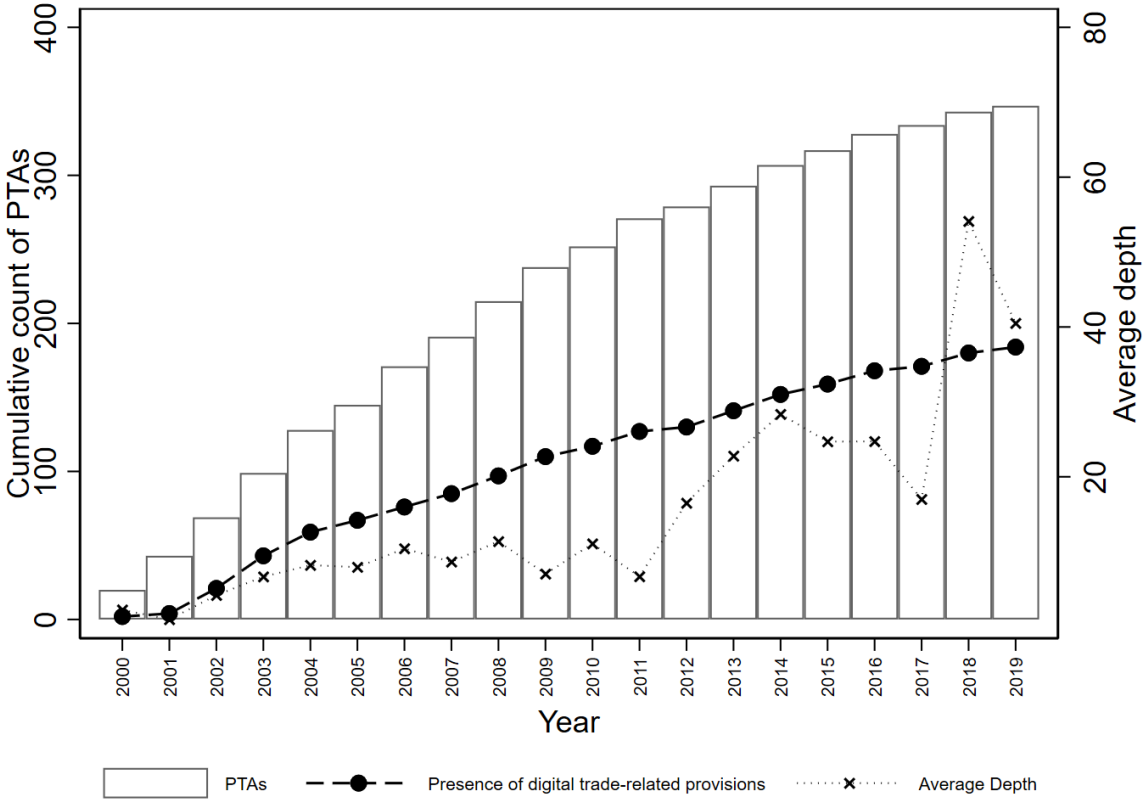

Figure 2: Operationalizing Depth

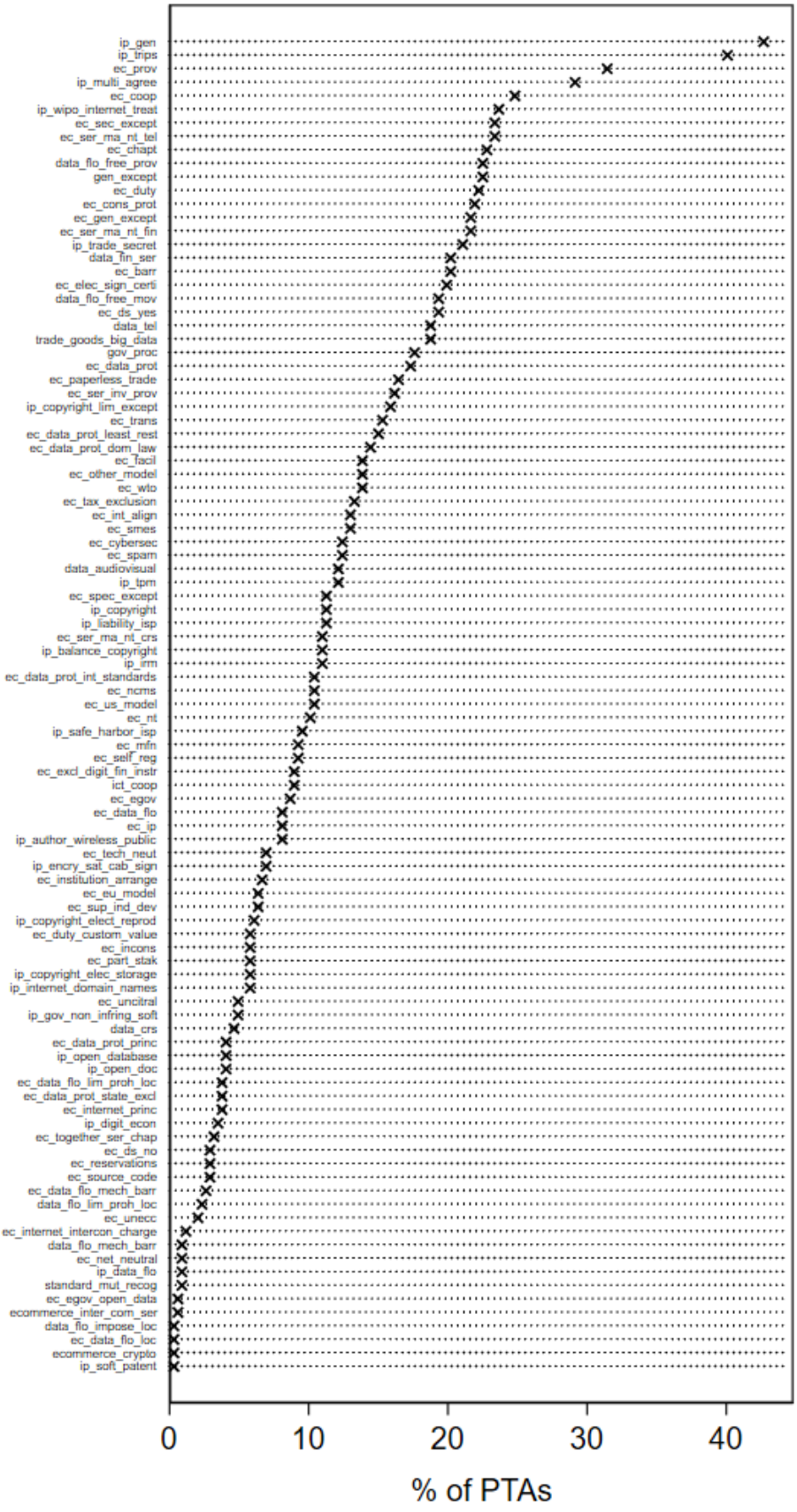

Figure 3: Digital trade-related interventions at the WTO, 1998-2018

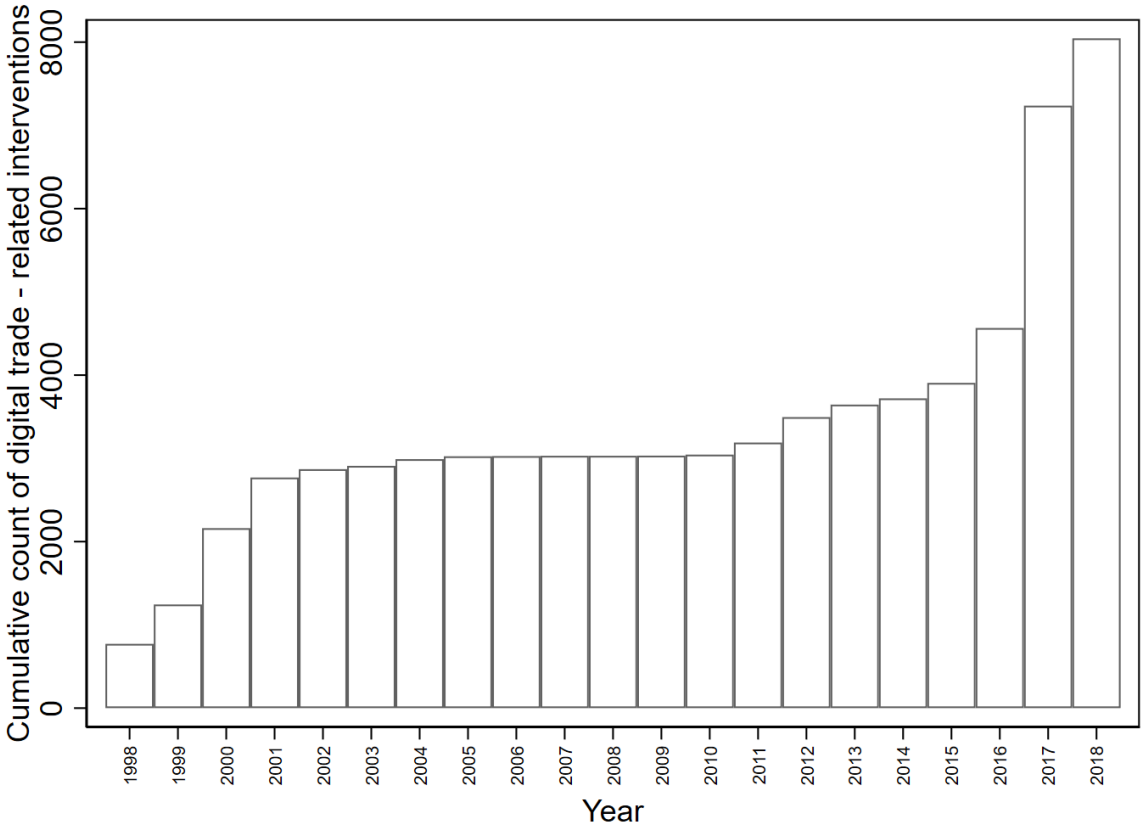

Table 1: Summary statistics

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Depth	11.608	17.948	0	74
Depth_Weighted	9.236	14.526	0	62.5
Depth_Rasch	4.487	7.535	0	34.854
WTO_Ecommerce_Interventions	44.801	59.185	0	419
ITA_Members_Percent	62.088	37.730	0	100
WTO_Members_percent	87.935	24.334	0	100
ITA_Trade	23.061	2.267	15.679	27.223
Internet_Users	34.378	25.875	.348	89.273
US	.048	.216	0	1
EU	.112	.316	0	1
CHN	.057	.233	0	1
GDP	26.278	1.718	20.223	30.118
GDP_Capita	9.3444	1.103	5.925	11.300
GDP_Asymmetry	26.087	4.980	0	30.446
Polity	5.808	4.375	-9	10
PTA_members	3.481	3.124	1	26
DESTA_Depth_Previous	4.762	1.816	0	7
N	347			

Table 2: Results from ordered probit models

VARIABLES	Model 1 Depth	Model 2 Depth	Model 3 Depth	Model 4 Weighted Depth	Model 5 Weighted Depth	Model 6 Weighted Depth	Model 7 Rasch Depth	Model 8 Rasch Depth	Model 9 Rasch Depth
WTO_Ecommerce_Interventions	0.00425*	0.00412	0.00438*	0.00470*	0.00462*	0.00483*	0.00467*	0.00456*	0.00481**
	(0.00256)	(0.00251)	(0.00259)	(0.00270)	(0.00265)	(0.00273)	(0.00243)	(0.00238)	(0.00245)
ITA_Members_Percent	0.00703**	0.00664**		0.00695**	0.00671**		0.00647**	0.00615**	
	(0.00278)	(0.00263)		(0.00273)	(0.00261)		(0.00281)	(0.00266)	
WTO_Members_Percent	-0.00199		0.00130	-0.00120		0.00205	-0.00161		0.00140
	(0.00393)		(0.00372)	(0.00394)		(0.00375)	(0.00395)		(0.00372)
ITA_Trade	0.151**	0.144**	0.191***	0.142*	0.138*	0.182**	0.149**	0.143**	0.186**
	(0.0725)	(0.0705)	(0.0721)	(0.0724)	(0.0706)	(0.0717)	(0.0730)	(0.0709)	(0.0727)
Internet_Users	0.0158**	0.0161**	0.0148**	0.0150**	0.0152**	0.0140*	0.0157**	0.0159**	0.0147**
	(0.00732)	(0.00732)	(0.00721)	(0.00729)	(0.00730)	(0.00718)	(0.00732)	(0.00732)	(0.00722)
US	0.889*	0.935*	1.048**	1.149**	1.177**	1.308**	0.935*	0.972**	1.083**
	(0.507)	(0.491)	(0.499)	(0.518)	(0.506)	(0.509)	(0.503)	(0.489)	(0.497)
EU	0.103	0.0938	0.175	0.147	0.142	0.219	0.112	0.105	0.179
	(0.253)	(0.250)	(0.253)	(0.258)	(0.256)	(0.259)	(0.248)	(0.246)	(0.249)
CHN	0.0438	0.0354	0.114	0.0470	0.0420		0.0707	0.0639	0.136
	(0.327)	(0.327)	(0.315)	(0.321)	(0.321)		(0.321)	(0.321)	(0.310)
GDP	-0.132	-0.129	-0.199**	-0.141	-0.139	-0.207**	-0.134	-0.131	-0.195*
	(0.102)	(0.102)	(0.0999)	(0.103)	(0.103)	(0.100)	(0.102)	(0.102)	(0.100)
GDP_Asymmetry	-0.00217	-0.00271	0.000179	-0.00351	-0.00384	-0.00117	-0.00181	-0.00225	0.000338
	(0.0125)	(0.0127)	(0.0129)	(0.0125)	(0.0126)	(0.0129)	(0.0127)	(0.0128)	(0.0130)
GDP_Capita	0.00507	-0.00138	0.0552	0.0239	0.0201	0.0734	0.00591	0.000733	0.0522
	(0.151)	(0.152)	(0.144)	(0.150)	(0.151)	(0.143)	(0.151)	(0.152)	(0.145)
Polity	0.00229	0.00202	0.00843	0.00332	0.00317	0.00933	0.000962	0.000749	0.00671
	(0.0217)	(0.0217)	(0.0209)	(0.0218)	(0.0218)	(0.0210)	(0.0219)	(0.0218)	(0.0211)
PTA_Members	-0.00497	-0.00540	-0.0214	-0.00616	-0.00642	-0.0223	-0.00336	-0.00371	-0.0184
	(0.0295)	(0.0294)	(0.0280)	(0.0295)	(0.0294)	(0.0280)	(0.0292)	(0.0291)	(0.0278)
DESTA_Depth_Previous	-0.0471	-0.0510	-0.0289	-0.0500	-0.0524	-0.0320	-0.0503	-0.0535	-0.0337
	(0.0676)	(0.0668)	(0.0673)	(0.0687)	(0.0679)	(0.0682)	(0.0679)	(0.0670)	(0.0678)
Observations	347	347	347	347	347	347	347	347	347
Time FE	Included	Included	Included	Included	Included	Included	Included	Included	Included
Region FE	Included	Included	Included	Included	Included	Included	Included	Included	Included
Model	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Results from ordered probit model on WTO_Ecommerce_Binary

VARIABLES	Model 10 Depth
WTO_Ecommerce_Binary	0.310*
	(0.186)
ITA_Members_Percent	0.00901***
	(0.00292)
WTO_Members_Percent	-0.000490
	(0.00407)
ITA_Trade	0.124
	(0.0781)
Internet_Users	0.0182**
	(0.00814)
US	1.562***
	(0.501)
EU	0.0549
	(0.240)
CHN	0.0252
	(0.361)
GDP	-0.115
	(0.107)
GDP_Asymmetry	-0.0143
	(0.0142)
GDP_Capita	-0.0109
	(0.160)
Polity	-0.00345
	(0.0225)
PTA_Members	-0.0154
	(0.0304)
DESTA_Depth_Previous	-0.0565
	(0.0737)
Observations	347
Time FE	Included
Region FE	Included
Model	Ordered Probit

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Results from ordered probit model on ITA_Members_Binary

VARIABLES	Model 11 Depth
WTO_Ecommerce_Interventions	0.00536**
	(0.00230)
ITA_Members_Binary	0.343*
	(0.192)
WTO_Members_Percent	0.000783
	(0.00400)
ITA_Trade	0.169**
	(0.0772)
Internet_Users	0.0174**
	(0.00808)
US	1.258**
	(0.608)
EU	0.213
	(0.264)
CHN	0.170
	(0.355)
GDP	-0.211**
	(0.104)
GDP_Asymmetry	-0.0110
	(0.0145)
GDP_Capita	0.00840
	(0.157)
Polity	-0.00259
	(0.0223)
PTA_Members	-0.0360
	(0.0285)
DESTA_Depth_Previous	-0.0530
	(0.0734)
Observations	347
Time FE	Included
Region FE	Included
Model	Ordered Probit

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Predicted probabilities – WTO Ecommerce Interventions

WTO_Ecommerce_Binary	Depth			
	1	2	3	4
0	.4869484	.0686194	.2266821	.21775
1	.3986938	.0676239	.2436473	.290035

Table 6: Predicted probabilities – ITA Membership

ITA_Members_Binary	Depth			
	1	2	3	4
0	.5102958	.0701743	.2221806	.1973493
1	.4065985	.0704895	.2488775	.2740345

Table 7: Results from a probit model on binary TAPED indicator

VARIABLES	Model 12 TAPED
WTO_Ecommerce_Interventions	0.00214
	(0.00238)
ITA_Members_Percent	0.0117***
	(0.00312)
WTO_Members_Percent	-0.00144
	(0.00436)
ITA_Trade	0.0754
	(0.0900)
Internet_Users	0.0199**
	(0.00966)
US	0.569
	(0.553)
EU	-0.230
	(0.310)
CHN	0.315
	(0.410)
GDP	-0.0399
	(0.125)
GDP_Asymmetry	-0.0182
	(0.0204)
GDP_Capita	-0.0238
	(0.176)
Polity	0.0287
	(0.0240)
PTA_Members	-0.0201
	(0.0290)
DESTA_Depth_Previous	-0.106
	(0.0847)
Constant	24.31
	(65.08)
Observations	347
Time FE	YES
Region FE	YES
Model	Probit

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Results from ordered probit models on TAPED PTAs

VARIABLES	Model 13 Depth	Model 14 Depth	Model 15 Depth	Model 16 Weighted Depth	Model 17 Weighted Depth	Model 18 Weighted Depth	Model 19 Rasch Depth	Model 20 Rasch Depth	Model 21 Rasch Depth
WTO_Ecommerce_Interventions	0.00582*	0.00576*	0.00586*	0.00638*	0.00632*	0.00641*	0.00684**	0.00683**	0.00687**
	(0.00345)	(0.00341)	(0.00344)	(0.00366)	(0.00361)	(0.00365)	(0.00336)	(0.00332)	(0.00334)
ITA_Members_Percent	-0.00339	-0.00366		-0.00246	-0.00275		-0.00551	-0.00555*	
	(0.00350)	(0.00308)		(0.00348)	(0.00306)		(0.00362)	(0.00322)	
WTO_Members_Percent	-0.00142		-0.00325	-0.00151		-0.00285	-0.000166		-0.00311
	(0.00502)		(0.00423)	(0.00491)		(0.00415)	(0.00503)		(0.00427)
ITA_Trade	0.337***	0.332***	0.322***	0.278***	0.272***	0.267***	0.356***	0.356***	0.331***
	(0.0837)	(0.0802)	(0.0848)	(0.0771)	(0.0735)	(0.0778)	(0.0813)	(0.0780)	(0.0822)
Internet_Users	0.00326	0.00339	0.00324	0.00103	0.00118	0.00107	0.00514	0.00516	0.00514
	(0.00970)	(0.00971)	(0.00969)	(0.00960)	(0.00962)	(0.00957)	(0.00940)	(0.00944)	(0.00945)
US	1.085*	1.096*	1.040*	1.432**	1.443**	1.397**	1.197**	1.199**	1.121*
	(0.574)	(0.573)	(0.575)	(0.581)	(0.579)	(0.582)	(0.587)	(0.587)	(0.587)
EU	0.541	0.536	0.531	0.617*	0.611*	0.609*	0.579*	0.579*	0.562*
	(0.340)	(0.338)	(0.341)	(0.352)	(0.349)	(0.353)	(0.336)	(0.332)	(0.338)
CHN	-0.239	-0.248	-0.233	-0.250	-0.261	-0.246	-0.194	-0.195	-0.187
	(0.400)	(0.396)	(0.403)	(0.390)	(0.386)	(0.392)	(0.390)	(0.385)	(0.394)
GDP	-0.428***	-0.422***	-0.412***	-0.398***	-0.391***	-0.388***	-0.460***	-0.459***	-0.433***
	(0.142)	(0.136)	(0.143)	(0.130)	(0.123)	(0.132)	(0.145)	(0.138)	(0.146)
GDP_Asymmetry	0.0425**	0.0421**	0.0414**	0.0301**	0.0295**	0.0296**	0.0490***	0.0490***	0.0472***
	(0.0172)	(0.0170)	(0.0170)	(0.0133)	(0.0131)	(0.0132)	(0.0180)	(0.0178)	(0.0177)
GDP_Capita	0.215	0.209	0.206	0.268	0.261	0.260	0.170	0.169	0.152
	(0.186)	(0.183)	(0.186)	(0.178)	(0.176)	(0.178)	(0.189)	(0.188)	(0.190)
Polity	-0.0481	-0.0483	-0.0500	-0.0483	-0.0486	-0.0495	-0.0575*	-0.0575*	-0.0607*
	(0.0323)	(0.0323)	(0.0329)	(0.0315)	(0.0315)	(0.0317)	(0.0341)	(0.0342)	(0.0353)
PTA_Members	-0.0131	-0.0129	-0.00702	-0.0156	-0.0154	-0.0112	-0.00351	-0.00348	0.00625
	(0.0455)	(0.0454)	(0.0459)	(0.0422)	(0.0421)	(0.0424)	(0.0391)	(0.0389)	(0.0394)
DESTA_Depth_Previous	0.0132	0.0121	0.00599	0.0158	0.0148	0.0104	0.00663	0.00650	-0.00437
	(0.0717)	(0.0716)	(0.0736)	(0.0756)	(0.0755)	(0.0768)	(0.0772)	(0.0772)	(0.0796)
Observations	184	184	184	184	184	184	184	184	184
Time FE	Included	Included	Included	Included	Included	Included	Included	Included	Included
Region FE	Included	Included	Included	Included	Included	Included	Included	Included	Included
Model	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Results from ordered probit models including WTO_Mission_Size

VARIABLES	Model 22 Depth	Model 23 Depth	Model 24 Depth	Model 25 Weighted Depth	Model 26 Weighted Depth	Model 27 Weighted Depth	Model 28 Rasch Depth	Model 29 Rasch Depth	Model 30 Rasch Depth
WTO_Ecommerce_Interventions	0.00415	0.00409	0.00432*	0.00460*	0.00458*	0.00477*	0.00456*	0.00454*	0.00481**
	(0.00260)	(0.00256)	(0.00262)	(0.00273)	(0.00270)	(0.00275)	(0.00246)	(0.00242)	(0.00245)
ITA_Members_Percent	0.00767***	0.00752***		0.00751***	0.00748***		0.00716***	0.00711***	
	(0.00275)	(0.00264)		(0.00272)	(0.00263)		(0.00277)	(0.00265)	
WTO_Members_Percent	-0.000845		0.00239	-0.000187		0.00299	-0.000300		0.00140
	(0.00403)		(0.00383)	(0.00403)		(0.00387)	(0.00406)		(0.00372)
WTO_Mission_Size	-0.0434	-0.0442*	-0.0336	-0.0383	-0.0385	-0.0287	-0.0490*	-0.0493*	
	(0.0272)	(0.0265)	(0.0269)	(0.0273)	(0.0266)	(0.0271)	(0.0273)	(0.0266)	
ITA_Trade	0.172**	0.170**	0.210***	0.161**	0.160**	0.198***	0.173**	0.172**	0.186**
	(0.0737)	(0.0723)	(0.0736)	(0.0735)	(0.0722)	(0.0732)	(0.0742)	(0.0728)	(0.0727)
Internet_Users	0.0179**	0.0181**	0.0164**	0.0169**	0.0169**	0.0153**	0.0180**	0.0181**	0.0147**
	(0.00753)	(0.00752)	(0.00734)	(0.00748)	(0.00747)	(0.00729)	(0.00759)	(0.00756)	(0.00722)
US	0.721	0.737	0.928*	1.005**	1.008**	1.208**	0.749	0.755	1.083**
	(0.496)	(0.487)	(0.488)	(0.507)	(0.501)	(0.498)	(0.491)	(0.484)	(0.497)
EU	-0.0689	-0.0758	0.0471	-0.00433	-0.00585	0.110	-0.0820	-0.0845	0.179
	(0.269)	(0.263)	(0.269)	(0.272)	(0.267)	(0.272)	(0.268)	(0.262)	(0.249)
CHN	-0.00405	-0.00888	0.0833	0.00463	0.00359	0.0899	0.0171	0.0154	0.136
	(0.324)	(0.324)	(0.313)	(0.319)	(0.319)	(0.308)	(0.318)	(0.318)	(0.310)
GDP	-0.0609	-0.0579	-0.148	-0.0782	-0.0775	-0.163	-0.0529	-0.0518	-0.195*
	(0.106)	(0.104)	(0.103)	(0.106)	(0.104)	(0.103)	(0.107)	(0.105)	(0.100)
GDP_Asymmetry	-0.00654	-0.00687	-0.00312	-0.00738	-0.00745	-0.00399	-0.00676	-0.00688	0.000338
	(0.0123)	(0.0122)	(0.0127)	(0.0123)	(0.0122)	(0.0128)	(0.0124)	(0.0123)	(0.0130)
GDP_Capita	-0.0624	-0.0664	0.00636	-0.0360	-0.0369	0.0314	-0.0700	-0.0715	0.0522
	(0.159)	(0.159)	(0.149)	(0.158)	(0.158)	(0.148)	(0.161)	(0.161)	(0.145)
Polity	0.00603	0.00596	0.0118	0.00660	0.00659	0.0122	0.00531	0.00529	0.00671
	(0.0221)	(0.0221)	(0.0213)	(0.0221)	(0.0221)	(0.0213)	(0.0222)	(0.0222)	(0.0211)
PTA_Members	-0.00450	-0.00466	-0.0219	-0.00569	-0.00572	-0.0227	-0.00260	-0.00266	-0.0184
	(0.0294)	(0.0294)	(0.0279)	(0.0294)	(0.0294)	(0.0278)	(0.0291)	(0.0291)	(0.0278)
DESTA_Depth_Previous	-0.0274	-0.0286	-0.0124	-0.0324	-0.0327	-0.0178	-0.0280	-0.0285	-0.0337
	(0.0689)	(0.0684)	(0.0682)	(0.0702)	(0.0698)	(0.0693)	(0.0693)	(0.0688)	(0.0678)
Observations	347	347	347	347	347	347	347	347	347
Time FE	Included	Included	Included	Included	Included	Included	Included	Included	Included
Region FE	Included	Included	Included	Included	Included	Included	Included	Included	Included
Model	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Notes

[1] We recognize the different definitions of electronic commerce and digital trade. The World Trade Organization (WTO) defines electronic commerce as the "production, distribution, marketing, sale or delivery of goods and services by electronic means". The Organisation for Economic Co-operation and Development (OECD) defines digital trade as "digitally-enabled transactions of trade in goods and services that can either be digitally or physically delivered, and that involve consumers, firms, and governments". For readability, we use the terms interchangeably in this article.

[2] Although plurilateral negotiations on e-commerce have been recently re-started in Geneva and led to the Joint Statement Initiative on Electronic Commerce.

[3] In the EU-Japan trade agreement, for instance, there is a side letter which suggest that the EU accepts Japanese data protection laws as equivalent.

[4] See also Wu (2017) on lack of WTO progress.

[5] Wunsch-Vincent and Hold (2016), for instance, study 26 EU, US and Asian PTAs signed between 2000 and 2011 and find pronounced differences in the respective PTA templates. In a more recent study by Wu (2017), this observation is confirmed based on a detailed analysis of 90 WTO-notified PTAs signed between 2001 and 2016.

[6] This concept is about non-discriminatory treatment of electronic transactions or services in respect to technological means used. E-mail exchange with former Swiss negotiator on e-commerce (19 December 2019).

[7] To compute the Rasch indicator, we follow the official Stata guide (available from https://www.stata.com/support/faqs/statistics/rasch-model/).

[8] The World Bank presents an alternative source of data to proxy for digital trade flows. The relevant data includes information on countries' information and communication technology (ICT) service exports (in US$ and as percentage of service exports) and ICT goods exports and imports (as percentage of total goods exports and imports). As one of our principal explanatory variables is related to the ITA, however, we base our empirical analysis on the ITA Trade indicator. Substituting the ITA Trade indicator with the World Bank data does not change the main empirical results.

[9] We would like to thank one reviewer for pointing us towards checking this correlation.

[10] The current coding does not allow to differentiate an EU from a US model based on the commitment levels. We assume commitments to be different, but deep in both cases.

[11] Substituting the more general DESTA Depth Previous variable with PTA members' previous depth for cooperation in digital trade does not change the main empirical results.

[12] The results are robust to changing the lag to two or three years. We choose a one year lag to limit the loss of observations.

[13] We would like to thank one reviewer for encouraging us to address this point.